

**Remarks**

Applicant requests reconsideration and allowance of this application in view of the foregoing amendment and the following remarks.

Applicant has the following comments upon the objections raised by the Examiner, using the same paragraph numbering as in the Detailed Action.

1. Applicant is grateful to the Examiner for pointing out the errors which, as will be seen from the Amendments to the Claims, have been corrected.

4. In relation to claim 1, it is limited by the feature of carrying out two steps simultaneously, i.e. emitting the radiation from the device while applying the substance to the interior surface.

Holbert (U.S.P.N.5,730,934) clearly teaches against such simultaneous emitting and applying. For example, it states at lines 6 to 8 of column 3 that “The tubular material may be subjected to a sterilant prior to irradiation by the ultraviolet radiation source”; at lines 35 to 38 of that column “The method may further comprise a step of subjecting the tubular material to a sterilant prior to the step of passing the interior surface of the tubular material by the ultraviolet radiation source”; at lines 17 to 20 of column 4 “The method may further comprise the step of subjecting the tubular material to a sterilant prior to the step of passing the interior surface of the material by the ultraviolet radiation source”; and (in relation to the embodiments closest to the invention of the present claim 1, namely the embodiments of Figures 6 and 7) at lines 21 to 24 of column 9 “Also, at a previous station along the conveyor system 80, a sterilant such as hydrogen peroxide or ozone may be sprayed into the cartons to enhance the sterilization of the cartons by the excimer ultraviolet lamp 20”. Thus, Holbert clearly leads the skilled person away from the simultaneous emitting and applying steps of claim 1.

Applicant respectfully points out that that Tuckner et al. (U.S.P.N.5,350,568) does not add anything relevant to Holbert since, as the Examiner acknowledges, it discloses, at lines 52 to 60 of column 10, applying a sterilant at a station 28 prior to a drying station 30,

which can instead constitute an ultraviolet light irradiation station. Thus, again, there is no disclosure of the simultaneous emitting and applying steps according to claim 1.

Turning to claim 13, the inventive feature is that the device which can extend in the container serves both to emit the radiation and to emit the substance. This is totally contrary to the teaching of Holbert, which makes it clear at lines 21 to 24 of column 9 that it is “at a previous station” to the station containing the excimer ultraviolet lamp 20 that the sterilant is sprayed into the carton. Tuckner et al. teach similarly to Holbert in disclosing the sterilizing and scoreline breaking station 28 as being prior to the ultraviolet light irradiation station (30).

Turning to Koderia (U.S.P.N.4,396,582), which the Examiner uses as a secondary reference to modify the disclosure in Tuckner et al. (presumably the unexpected mention of “Holbert” on line 6 of page 4 of the Action is intended to be “Koderia”). Whichever of Koderia and Holbert was intended, Applicant respectfully submits that a fair reading of the disclosure in Koderia is that it teaches the skilled person against any modification of either Holbert or Tuckner et al., in which the sterilant is applied before the radiation, since, at lines 35 to 39 of column 7, Koderia et al. teach that “in order to derive the full benefits from the sterilizing agents, and to cancel their drawbacks, the object should first be immersed in or otherwise treated with the sterilizing liquid and then exposed to ultraviolet radiation.

Claims 4, 6 (as amended), 11 and 17 are patentable by virtue of their dependency on claims 1 and 13.

Claim 7 is patentable by virtue of its dependency on claim 1.

Claim 10 is patentable by virtue of its dependency on claim 1.

5. Claim 2 is patentable by virtue of its dependency on claim 1. Furthermore, as regards Swain et al. (U.S.P.N.5,419,058), Applicant respectfully submits that a person of ordinary skill in the art in the field of sterilizing containers would not consider Swain et al. to be at all relevant to the present invention. For example, it is stated at lines 9 to 12 of column 1 that its invention “is directed to an improved automated substrate loading and

photoreceptor unloading system for loading, supporting and unloading substrates, optionally in combination with collars”. The fact that the Swain et al. reference is in a field remote from that of the present invention and the inventions of Holbert, Tuckner et al. and Kodera is clearly demonstrated by the fact that none of the International Classification and United States Classification codes of Swain et al. is even close to any of the International Classification and United States Classification codes of the other three references.

Turning to claim 3, it is patentable by virtue of its dependency on claim 2.

In addition, in Swain et al., it is disclosed at lines 13 to 25 of column 6 that “The support mandrel continually moves the substrate 14 upward and downward past the spray of the nozzle. Preferably, substrate 14 encounters the spray of the nozzle only during the upward movement of substrate 14. The vertical movement of the substrate 14 can be accomplished in a variety of ways, including utilizing a piston and cylinder combination along with an associated actuator thereof to drive the support mandrel vertically . . . If desired, the support mandrel may also rotate while moving vertically.” Thus, there does not appear to be any disclosure in Swain et al. that the nozzle and the substrate should move transversely (e.g. horizontally) to that direction of relative vertical movement simultaneously with the applying of the spray to the substrate. To sum up, Swain et al., in addition to its not being relevant as explained above in relation to claim 2, does not disclose any equivalent of the feature of claim 3 (as amended) of “advancing said device and said partially completed container simultaneously and non-reversingly in a direction transverse to said partially completed container while performing said emitting and said applying”.

In regard to claim 14, see the comments above as in regard to claim 2 and, in regard to claim 16, see the comments above as in regard to claim 3.

6. Claim 5 is patentable by virtue of its dependency on claim 1.

7. Claim 8 is patentable by virtue of its dependency on claim 7. Moreover, Applicant is unable to understand the ground for the Examiner’s objection against claim 8 in relation

to Palaniappan et al. (U.S.P.N.6,056,918). Claim 8 is clearly directed to the relative motion between the device and the partially completed container (to insert the device into one of the open ends of the container) being at substantially constant speed while the emitting and the applying are being performed. The Examiner asserts that the “reference teaches forming a uniform coverage layer of hydrogen peroxide (col. 8, lines 48-51) on the surfaces of cartons” and that “This result is achieved through a constant speed motion as taught by the Specification”. However, the lines in question actually state “Existing H2O2-UV system on Tetra Rex machines was improved by changing over to vapor instead of liquid H<sub>2</sub>O<sub>2</sub>. Vapor introduces improved and uniform coverage throughout the cartons. Droplets and excess peroxide in the package are eliminated”. It is the Examiner who has introduced the references to there being a “layer” of hydrogen peroxide “on the surfaces” of cartons, but the passage to which he refers does not lend any support to what he alleges that the reference teaches.

As regards the Examiner’s assertion that this result is achieved through a constant speed motion as taught by the Specification, Applicant is unable to find any support whatsoever for that assertion in Palaniappan et al. and therefore respectfully requests that the Examiner identify where the teaching is to be found in the Specification. As regards the final comment that “such a modification [i.e. of including a constant speed motion between the sterilant source and the partially completed container] leads to an improvement in the sterilization capability of the system as taught by the Palaniappan reference (col. 8, lines 52-54), there seems no support for this assertion whatsoever, especially since the passage at lines 52 to 54 of the Palaniappan reference is referring to improving the sterilization capability of the system by changing over to vapor instead of liquid H<sub>2</sub>O<sub>2</sub>.

8. Turning to claims 9 and 15, these are patentable by virtue of their dependency on claims 7 and 13. Furthermore, the lamp 20 of Holbert is not a “mandrel” in accordance with any of the definitions in the famous United States Webster’s Dictionary. Applicant attaches the front page and an enlarged inside page of the Unabridged Webster’s Third New International Dictionary, from the inside page of which the Examiner will see the various definitions of “mandrel”. Taking the possible definitions in turn, the lamp 20 is

clearly not “inserted into a hole in a piece of work so as to support the work” nor does it serve as “a core around which metal or other material may be cast, molded, forged, bent or otherwise shaped, nor is it one of “a train of jointed units”, nor is it something “on which a tool ... is mounted” nor is it “a temporary interior support for a thin-walled tube”. Thus, the ground for this objection is clearly insupportable. The Examiner asserts that the lamp 20 is “capable of supporting the partially completed container by being inserted within it”. In Figure 7, to which he refers, the carton 70 is clearly supported by the conveyor system 80 and the lamp 20 would appear to be out of contact with the carton 70. Moreover, there does not appear to be any disclosure in Holbert that the lamp 20 is even capable of being moved into supportive contact with the carton 70, so that Applicant cannot understand where the Examiner finds in Holbert the disclosure to support his assertion.

As regards Rodocker (U.S.P.N.4,590,740), it has an indexing mandrel assembly 24, upon which the carton tubes 44 are loaded upon respective mandrels 28. Following bottom-closing, the cartons are stripped from the mandrel assembly 24 and transferred to the horizontal conveyor system 64 of Rodocker, as shown in Figure 3 of Rodocker. It is at one of the stations along the conveyor system 64 that the lamp 20 of Holbert would be inserted into the cartons in turn to sterilize their interiors. The Examiner asserts that “it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of the Holbert reference by including a mandrel assembly as taught by the Rodocker reference”. Since a mandrel assembly corresponding to the mandrel assembly 24 of Rodocker would immediately be understood by a person skilled in the art to be virtually certain to exist ahead of the conveyor system 80 in Holbert, Rodocker adds nothing whatsoever to the teaching of Holbert in relation to the presence of a mandrel assembly. In any case, the lamp 20 is clearly totally impractical for use as a mandrel according to any of the definitions referred to above.

9. As regards claims 12 and 18, these are patentable by virtue of their dependency on claims 11 and 17. As regards the citing of Tuckner et al., Applicant respectfully submits that Figure 2 does not in any way teach “emitting hydrogen peroxide from the outer end of the device at 360° around the axis of the container”, as asserted by the Examiner.

Moreover, he asserts that Palaniappan et al. (U.S.P.N.6,120,730) teaches emitting hydrogen peroxide substantially perpendicularly to the axis of the container and refers to the nozzle 63 in Figure 5 and the arrows 260. The corresponding passage of the Specification is at lines 60 to 67 of column 6, and is referring to gas phase hydrogen peroxide being applied onto the container 50 as illustrated by the arrows 260. The reference goes on to state at the top of column 7 that “The hydrogen peroxide gas enters and flows onto the opened interior 264 of the container 50, the exposed exterior of the container 50, and also on an optional fitment 262”. Thus, it would appear that the nozzles 63 and 64 are used to produce a cloud of gaseous  $H_2O_2$  and there is no disclosure that the nozzles emit the vapor substantially perpendicularly to the axis of the container and for  $360^\circ$  around the axis of the container, as required by the claims.

10. Claim 19 is patentable through its dependency on claim 17. Not only is the lamp 20 of Holbert not a “mandrel”, but, furthermore, a “mandrel cap” as understood by those of ordinary skill in this art is not a lid of a container, but is the head or outer end of a mandrel. Thus, a person of ordinary skill in the art would dismiss Leshik (U.S.P.N.4,931,302) as not relevant.

12. As to claim 20, Tuckner et al. does not disclose “A method of rendering non-viable micro-organisms in a partially completed container open at opposite ends”, because, as will be immediately understood by a person of ordinary skill in this art, the container 10 is already bottom-closed when it reaches the combined sterilizing and top pre-breaking station 28. As explained at lines 56 to 60 of column 9 of Tuckner et al., “Preferably, sterilizing solution . . . is continuously discharged through the spray nozzles 34” at that station. Thus, the bottom of the container is already closed and sealed before the sterilizing solution is introduced. Claim 20 has been amended to bring out this distinction more clearly by the addition of the phrase at the end of the claim.

13. Claim 21 is patentable by virtue of its dependency on claim 20. In relation to Palaniappan et al. (U.S.P.N.6,056,918), see the comments above in relation to claim 8.

14. Claim 22 is patentable by virtue of its dependency on claim 20. Furthermore, a person of very ordinary skill in the art would be aware that the mandrel assembly 24 of

Rodocker (which has the bottom pre-breaking station B, the bottom heating station C, the bottom tucking and pressing station D and the transfer and bottom pressing station E – see lines 23 to 32 of column 3) would be placed ahead of the sterilizing and top pre-breaking station 28 of Tuckner et al. This is because the apparatus 22 of Tuckner et al. is stated (at lines 14 to 19 of column 4 of Tuckner et al.) to be “A carton formation apparatus 22” which “receives preformed blanks, opens the blanks to form tubes, seals the bottom end of each of the tubes to form cartons 10 having an open top and upstanding walls, and then places the cartons 10 in sequence on a conveyor 24”. Thus, the combination of the two references would still stop far short of what is claimed in claim 22, since neither the mandrel 28 of Rodocker would contain a device which emits a dispersion of a substance capable of rendering micro-organisms non-viable, nor would the anvil 62 of Tuckner et al. be anywhere near the carton tube when its bottom end is being closed.

15. Claim 31 is patentable by virtue of its dependency on claim 20. In addition, in relation to Swain et al., see the comments in relation to claims 2 and 3 above.

16. Claim 32 is patentable by virtue of its dependency on claim 20. In addition, in relation to Tuckner et al. and Palaniappan et al. (U.S.P.N.6,120,730), see the comments in relation to claims 12 and 18 above.

17. In regard to claims 23 and 24, and the citation of Swain et al., see the comments in respect of claim 2 above.

In relation to claims 33 and 39, these are patentable by virtue of their dependency on claims 23 and 24.

Claim 34 is patentable by virtue of its dependency on claim 23, and claim 35 is patentable by virtue of its dependency on claim 34.

In addition, Applicant respectfully submits that the Examiner may have become confused in relation to what is disclosed in Holbert. He states that it “teaches that the container is a partially completed container in the form of a folded sleeve open at both ends (Col. 6, lines 26-42)”. However, the passage from lines 26 to 42 of Holbert is

describing the Figure 2 system in which, as one of ordinary skill in this art knows, cannot have its material 32, undergoing fabrication to a container shape, open at both ends, otherwise the liquid product being supplied through the filling pipe 36 will simply pour out of the lower end. He goes on to state “the Specification on page 8, numbered lines 25-27 and page 9, numbered lines 1-3 teaches that constant speed would results [sic] in a uniform sterilization”, but there are no pages 8 and 9 of the Specification, nor do lines 25 to 27 of column 8 and lines 1 to 3 of column 9 have anything to do with constant speed resulting in uniform sterilization.

As regards the applicability of the Swain et al. reference to the Holbert reference, Applicant’s comments are as above in relation to claim 2.

Referring to claim 37, this claim is patentable by virtue of its dependency on claim 24. Moreover, the Examiner again appears to have become confused as regards what is disclosed by Holbert. He states that “the Holbert reference teaches forming containers from packaging material (col. 6, lines 26-40) that result in a tubular container opened at both ends”. As a person of ordinary skill in the art would appreciate, this is incorrect, since the passage at column 6 lines 26 to 40 is referring to the version of Figure 2, which results in a tubular container 44 sealed at both ends and not open at both ends. Furthermore, as a person of ordinary skill would appreciate, the carton 70 of Figure 6 is produced upon a system akin to that of Figure 3 of Rodocker and completely different from that of Figure 2 of Holbert. In relation to Swain et al., and its applicability to Holbert, Applicant’s comments are as above in relation to claim 2. Furthermore, the Examiner’s assertion is incorrect that “The Swain reference teaches the concept of moving the substrate . . . with a drive mechanism for displacing the container (Col. 6, lines 18-25)”, since there does not appear to be any disclosure in Swain et al. of displacement of a container (presumably a container for the substrate).

Turning to claim 38, it is patentable by virtue of its dependency on claim 24. In addition, see the comments upon the inapplicability of the Holbert and Swain et al. references that appear above in relation to claim 3.



18. As regards claim 36, it is patentable by virtue of its dependency on claim 34. In addition, Applicant's comments upon the inapplicability of Holbert and Rodocker correspond to those above in relation to claims 9 and 15.

19. Claim 40 is patentable by virtue of its dependency on claim 39. Moreover, Applicant's comments in respect of the inapplicability of Leshik et al. are as above in relation to claim 19.

20. In relation to claims 25 and 26, Applicant's comments upon the inapplicability of the cited references correspond to those above in relation to claim 22.

21. In respect of claims 27 and 28, Applicant's comments upon Holbert's disclosing a mandrel and the result of combining Holbert with Rodocker are as above in relation to claims 9 and 15 and upon Holbert's disclosure at lines 26 to 40 of column 60 are as above in relation to claims 34 and 35.

22. In relation to claims 29 and 30, Applicant's comments upon the applicability of the cited references are as for those in respect of claims 3 and 16, respectively.

23. In relation to claims 41 and 46, they are patentable by virtue of their dependency on claims 25 and 26. Moreover, Applicant's comments upon the cited references correspond to those above in relation to claims 2 and 14, respectively.

As regards claims 42 and 47, these are patentable by virtue of their dependency on claims 25 and 26. Moreover, Applicant's comments in respect of the cited references are as per the comments in relation to claims 3 and 16, respectively.

As regards claim 43, it is patentable by virtue of its dependency on claim 25.

24. Claim 44 is patentable by virtue of its dependency on claim 43. Moreover, Applicant's comments upon the relevance of the cited references correspond to those as for claim 8 above.


25. Claim 45 is patentable by virtue of its dependency on claim 25.

Conclusion

In view of the foregoing amendment and remarks, Applicant submits that this application is in condition for allowance, and notice to that effect is respectfully requested. Please telephone Applicant's undersigned attorney at (216) 622-8578 if there are any questions.

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Respectfully submitted,

  
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